CHARGE NUMBER: Various

PROGRAM TITLE: Analytical Investigations

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I. TOBACCO ANALYSIS

A. CO_2 Expansion - A program has been initiated to determine what role the water soluble components of tobacco play in the CO_2 expansion process. E-55 tobacco has been water extracted and the solubles reapplied at various levels. The resulting tobacco was equilibrated and expanded with CO_2. The data is being evaluated.

B. Beta-Carotene/Xanthophyll - Standard curves for β-carotene an xanthophyll in ethanol have been normalized using the 887 cm^{-1} ethanol band. A linear dependence is observed over the range 10^{-6} to 10^{-4} moler/liter. Degradation rates for β-carotene in CCl_4 have been determined as a function of concentration, sample volume, and laser power. Degradation is currently being studied to distinguish oxidative and photochemical processes.

C. Colorimetric Determination of Nornicotine - Work has begun on development of an automated procedure for the determination of nornicotine. The recently received AutoAnalyzer II system is being used. Some difficulty is being encountered in pumping the nonaqueous solvents demanded by the reaction but initial results look encouraging.

D. Ammonia in Mainstream Smoke - Further analyses of mainstream smoke for ammonia have shown that the difference in values by the Robot Chemist and AutoAnalyzer II is real, with the AutoAnalyzer II giving higher ammonia values. Since on-line dialysis on the AutoAnalyzer II is one difference in the procedure, the dialysis was by-passed, but there was no significant change in results. Additional experiments will be done to determine if the difference is in reaction chemistry or in instrumentation.

E. Experiments are continuing for the development of a procedure for the determination of trimethylamine (TMA) and TMA·HCL in filler and smoke. Solubility of TMA and TMA·HCL in $CHCl_3$ precludes the use of $CHCl_3$ as a clean-up solvent. Other solvent systems will be tried. TMA·HCL standards (4 ppm) in H_2O have been found to have long term stability.

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